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NATURAL DISASTER REDUCTION: HAZARD RESISTANT STRUCTURES

Technical session

Addendum

Protection of non-engineered housing from natural hazards

Summary of presentation by Dr. A.S. Arya, Professor Emeritus, Earthquake Engineering, University of Roorkee, India, and member of the Scientific and Technical Committee for the International Decade for Natural Disaster Reduction

1. It is well known that, year after year, millions of non-engineered houses (traditional vernacular dwellings of wood, clay, adobe, stone and brick laid in clay, mud etc.) are lost due to three natural disasters, that is, the floods, cyclones (typhoons and hurricanes) and earthquakes occurring around the world, particularly in the developing world. The consequent loss of human and cattle lives, damage to property and destruction of means of livelihood cause much misery to the survivors. Besides, such destruction becomes a tremendous drain on the economy of many countries and recurrence of disasters provides a big constraint against their development.

2. One of the cherished goals of the International Decade for Natural Disaster Reduction is, therefore, to develop the capacity of such disaster-prone countries to be able not only to cope with this challenge but also to reduce the disastrous effect by pro-active prevention and preparedness measures. There is at present considerable know-how available, partly

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developed indigenously in the countries, both through age-old experience of living with the disasters and partly through the research on disaster-resistant construction methods of such buildings carried out in the past few decades. These construction methods, which include proper choice or improvement of site, appropriate geometry of house plan and elevation, introduction of bands and braces in walls and roof, proper connection details for adequate integration of the various elements of the roof and the walls, waterproofing to minimize rain and flood damage, improvement in quality of construction and the like, are seen to be effective in reducing the damaging consequences of earthquakes, cyclones and floods on the common man's house. Being of an incremental nature (maintaining basic materials and construction techniques rather than replacing them wholesale), these are found to be socially acceptable, economically feasible and easily absorbed into local construction methodologies.

3. Considerable experience has also been gained throughout the world in reducing losses of life and property wherever the improved disaster-resistant methods were used in the traditional constructions. The presentation will highlight much improved methods and also the case studies of their successful application. The more important guidelines, manuals and codes available on this subject will be listed for ready reference.

4. Another issue to be addressed is the transfer of this technology to the local level (i.e., rural, semi-urban or even urban areas) where the problem of hazard damage of buildings exists acutely in most countries. It is known that in some countries considerable progress has been made in the agricultural and health sectors through extension services. An attempt is made to highlight such information and to make recommendations in regard to the dissemination and extension services which could propagate the use of disaster-resistant building technologies.